

**CERATOCULICOIDES, A NEW GENUS RELATED TO CERATOPOGON
MEIGEN**

(DIPTERA: CERATOPOGONIDAE)

WILLIS W. WIRTH, *Systematic Entomology Laboratory, Agricultural Research
Service, U. S. Department of Agriculture*¹

and

NIPHAN CHANTHAWANICH RATANAWORABHAN, *Migratory Animal Pathological
Survey, Applied Scientific Research Corporation, Bangkok, Thailand*

ABSTRACT—*Ceratoculicoides*, n. gen. is proposed for *Helea longipennis* Wirth, type-species, from northern and eastern North America, *Helea virginiana* Wirth from eastern U.S.A., *blantoni*, n. sp. from Maryland and Virginia, and *Ceratopogon gracilipes* Remm from Estonia.

A small group of *Ceratopogon* species are set apart from others in the genus by a number of very distinct characters. Wirth (1952) commented on these in his description of *Helea longipennis* Wirth and later Wirth (1965) and Remm (1967) assigned the three known species to the subgenus *Nilohoelea* Kieffer, using the interpretation of the latter suggested by Macfie (1940).

An examination of the original description of *Nilohoelea* Kieffer (1921) and the type species *Nilohoelea albipennis* Kieffer from the Sudan, indicates that *Nilohoelea* should more properly be included in the synonymy of the subgenus *Isohoelea* Kieffer. Kieffer's figure of the male genitalia of *N. albipennis* shows a characteristically sickle-shaped and distally narrowed dististyle quite unlike any found in the species reviewed here, but strikingly similar to that described for *Ceratopogon (Isohoelea) sahariensis* Clastrier (1961) from Mouydir, Algeria, in the Central Sahara.

We therefore take this opportunity to propose a new genus for the three known species erroneously assigned to *Nilohoelea*, and to describe a new North American species.

***Ceratoculicoides*, n. gen.**Type-species: *Helea longipennis* Wirth.

Diagnosis.—Moderate size species with female claws small and *Culicoides*-like on hind leg; first radial cell obsolete, second small; vein M2 interrupted at base.

Eyes hairy or bare, well separated by an angular space in female (fig. 1e). Female antenna (fig. 1a) with five distal segments moderately elongate, shaped much as in *Culicoides*, distal sensory pit present on third segment; antennal ratio about 1.1 to 1.25. Male antennal segments 3–13 fused, 13–15 elongate with short verticils (fig. 1g). Female palpus (fig. 1b) short, third segment with moderately

¹ Mail address: c/o U. S. National Museum, Washington, D. C. 20560.

deep pit. Female mandible (fig. 1f) slender distally with large teeth. Wing (fig. 1d) narrower than in *Ceratopogon*, usually somewhat infuscated along veins; costa short, 0.50–0.55 of wing length in American species, 0.69 in *gracilipes* Remm. Legs (fig. 1h) moderately slender, without conspicuous bristles; tarsal ratio about 2.2; fourth tarsomere slender; claws of female (fig. 1j) long and subequal to slightly unequal on fore and mid legs, small and equal, similar to the male claws on hind leg (except in *gracilipes* which has large claws only on fore leg). Female genital opening provided on each side with a narrow, mesally forked sclerotization (fig. 1n); two large and one rudimentary spermathecae (fig. 1m) present (only one large spermatheca in *gracilipes*), with characteristic long oblique necks. Male genitalia (fig. 1l) with ninth sternum rather broad, with small caudomedian excavation; ninth tergum moderately long and tapering with well-developed, digitiform apicolateral processes. Basistyle moderately stout, dististyle slender and nearly straight. Aedeagus with characteristic shape, with low basal arch and short anterolateral basal arms; broad main portion usually with slightly cleft apex and bearing small, dorsally bent, apicolateral teeth. Parameres (fig. 1k) separate, each arising from a slender anterolateral apodeme similar to that of *Alluaudomyia*; main portion a straight, tapering rod with simple tip usually somewhat bent posterolaterally.

This genus combines some of the characters of *Isohelea* and *Brachypogon* Kieffer, while at the same time presenting some aspects similar to the genus *Culicoides* Latreille. With *Isohelea* it shares the short costa, interrupted vein M2, distinct apicolateral processes of the male ninth tergum, and separate male parameres. With *Brachypogon* it has the reduced radial cells, with the reduction not so complete as in that genus. The small claws on the hind (and sometimes mid) tarsi of the female are unique in the tribe Ceratopogonini, but are reminiscent of the claws of the genus *Culicoides*. The antennae are more suggestive of *Culicoides* than of *Ceratopogon* except for the restriction of the sensory tufts to the third segment. This genus is also quite distinctive in the shape of the sclerotization on each side of the female genital opening, and in the general structure of the male genitalia.

KEY TO THE SPECIES OF *Ceratoculicoides*

1. Female claws long only on fore leg; one spermatheca present; male aedeagus with distinct caudomedian cleft and caudolateral teeth; male parameres slender on distal half **gracilipes** (Remm)
 Female claws long on fore and mid legs; two spermathecae present; male genitalia various 2
2. Legs yellow; small species, wing 0.90–1.10 mm long; male aedeagus slightly cleft distad with distinct caudolateral teeth, parameres stout with apices laterally bent **virginianus** (Wirth)
 Legs brownish; larger species, wing 1.15–1.25 mm long; male genitalia various 3
3. Female spermathecae larger, 0.082 and 0.075 mm in diameter; male aedeagus with simple rounded tip, parameres slender on distal half **longipennis** (Wirth)

Female spermathecae smaller, 0.046 and 0.040 mm in diameter; male aedeagus with truncate tip bearing sharp caudolateral teeth; parameres stout with abruptly pointed tip **blantoni**, n. sp.

Ceratoculicoides longipennis (Wirth), n. comb.
(Fig. 1)

Helea longipennis Wirth, 1952:201 (female; ? subgenus; California).

Ceratopogon (Nilohelea) longipennis (Wirth): Wirth, 1965:133 (combination).

Female.—Length of wing 1.25 mm.

Head: Brown, including antennae and palpi. Eyes with numerous, moderately prominent interfacetal hairs. Antenna (fig. 1a) with proximal segments not as short and stout as in *virginianus*, lengths of flagellomeres in proportion of 23-19-18-20-20-22-22-23-31-35-37-40-43; antennal ratio 1.12. Palpal segments (fig. 1b) with lengths in proportion of 15-25-30-15-23; third segment short, length/breadth ratio 1.66, with a small deep sensory pit.

Thorax: Subshining brownish black; legs brown, knee joints and tarsi paler. Claws (fig. 1j) nearly as long as fifth tarsomere on fore and mid legs, small and equal, same size as male claws, on hind leg. Hind basitarsus 2.1 as long as second tarsomere. Wing (fig. 1d) darker than in *virginianus*, with more macrotrichia at wing margin distally; costa extending to 0.53 of wing length. Halter pale.

Abdomen: Dark brown. Spermathecae (fig. 1m) ovoid with long oblique necks, with pronounced hyaline perforations; measuring 0.082 + 0.032 (neck) by 0.075 mm and 0.075 + 0.023 by 0.060 mm.

Male.—Similar to the female with the usual sexual differences; legs and wings darker in color, wings practically without marginal macrotrichia; antennal plumes brown; antennal segments 13-15 with lengths in proportion of 62-52-68. Genitalia (fig. 1L): Aedeagus with main body slightly longer than broad, basal arch extending to a fourth of total height; distal margin evenly rounded, without trace of median notch or sublateral teeth. Parameres (fig. 1k) each stout at base, evenly tapered to slender pointed tip, the latter slightly bent ventrad.

Distribution.—Washington, California, and from Quebec to Florida.

Type.—Holotype female, Stony Brook, Sequoia National Park, Tulare Co., California, 13 July 1947, W. W. Wirth, "attempting to bite" (Type no. 59944, USNM).

Specimens Examined.—CALIFORNIA: Laguna Beach, 28 March 1935, A. L. Melander, 1 female; Mill Valley, Marin Co., 10 May 1958, H. B. Leech, 1 female; Redding, 14 May 1948, W. W. Wirth, stream margin, 1 female (paratype); Stony Brook, Sequoia National Park, etc. (holotype female). FLORIDA: Torreya State Park, Liberty Co., 27 April 1958, F. S. Blanton, light trap, 1 male; 20 May 1966, H. V. Weems, light trap, 2 males; 22 April 1967, W. W. Wirth, light trap, 1 male. MARYLAND: Forest Glen, Montgomery Co., 5 June 1967, W. W. Wirth, light trap, 4 males, 1 female. NEW YORK: Allegany State Park, 3 June 1963, W. W. Wirth, mossy woods and stream margin, 5 males, 9 females. OREGON: North Plains, Washington Co., 19 May 1963, K. Godden, along stream, 1 male; Wetmore Campground, Baker

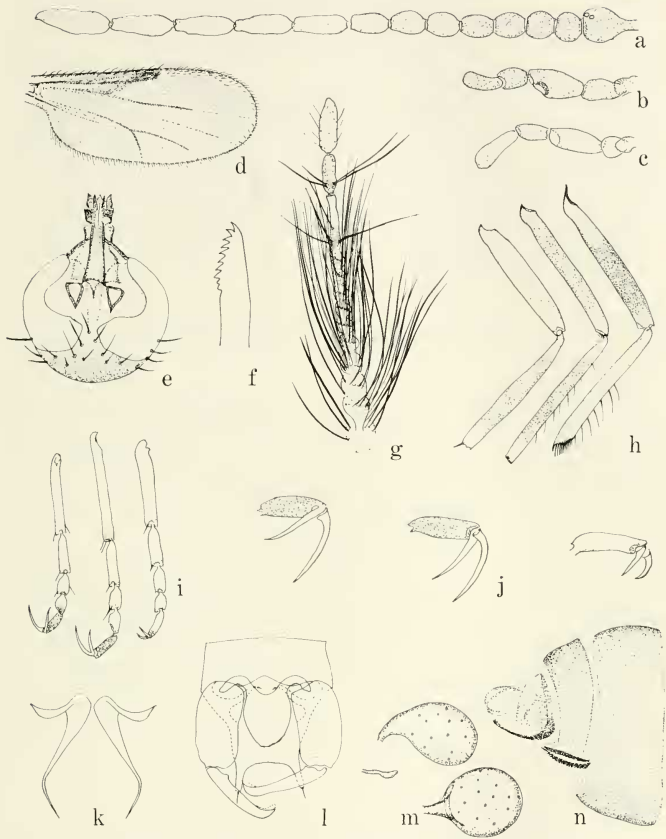


Fig. 1. *Ceratoculicoides longipennis* (Wirth): a, female antenna; b, female palpus; c, male palpus; d, female wing; e, female head; f, female mandible; g, male antenna; h, female legs, left to right, fore, mid, and hind; i, female tarsi, fore, mid, and hind; j, female claws, fore, mid, and hind; k, male parameres; l, male genitalia, parameres removed; m, female spermathecae; n, female genital sclerotization.

Co., 9 mi w Unity, 2 July 1965, malaise trap, 1 female. QUEBEC: Meach Lake, 6 June 1960, W. W. Wirth, 1 female. VIRGINIA: Falls Church, May 1958, W. W. Wirth, light trap, 2 males, 14 females. WASHINGTON: Adna, 10 July 1917, A. L. Melander, 1 female.

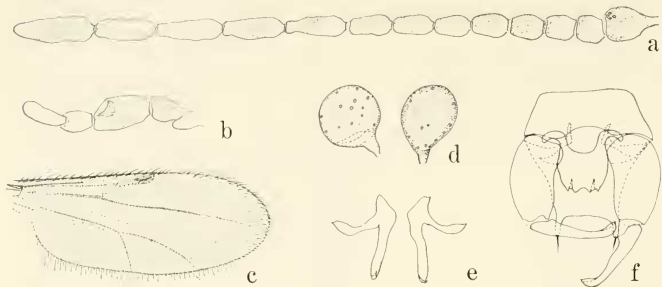


Fig. 2. *Ceratoculicoides blantoni*, n. sp.: a, female antenna; b, female palpus; c, female wing; d, female spermathecae; e, male parameres; f, male genitalia, parameres removed.

Discussion.—This species is distinguished from *virginianus* (Wirth) by its larger size and brownish legs, and from *blantoni*, n. sp. by its larger spermathecae, distally slender male parameres, and male aedeagus without sublateral teeth on the distal margin.

***Ceratoculicoides blantoni*, n. sp.**

(Fig. 2)

Female.—Length of wing 1.15 mm. A dark brown species, nearly indistinguishable from *C. longipennis*. Antennal ratio 1.07; costal ratio 0.50. Spermathecae (fig. 2d) much smaller, measuring $0.064 + 0.014$ by 0.046 mm and $0.051 + 0.011$ by 0.040 mm, hyaline perforations absent.

Male.—Lengths of antennal segments 13–15 in proportion of 65-55-55. Genitalia (fig. 2f): As in *C. virginianus*, but the aedeagus with main body slightly broader than long, the distal margin without mesal notch but with prominent, dorsally projecting teeth. Parameres (fig. 2e) stout distally as in *virginianus*, but the tips more abruptly narrowed with the points not bent laterad.

Distribution.—Maryland, Virginia.

Types.—Holotype male, allotype female, Snow Hill, Worcester Co., Maryland, 19 May 1968, W. H. Anderson, light trap (Type no. 70650, USNM). Paratypes, 8 males, 4 females, Falls Church, Virginia, May 1958, W. W. Wirth, light trap.

Discussion.—We are pleased to name this species for Professor F. S. Blanton of the University of Florida in recognition of his long and dedicated work on American Ceratopogonidae. Pinned specimens of *C. blantoni* cannot be distinguished from those of *C. longipennis*, but in slide mounts the smaller female spermathecae and the shapes of the male aedeagus and parameres will afford an easy separation.

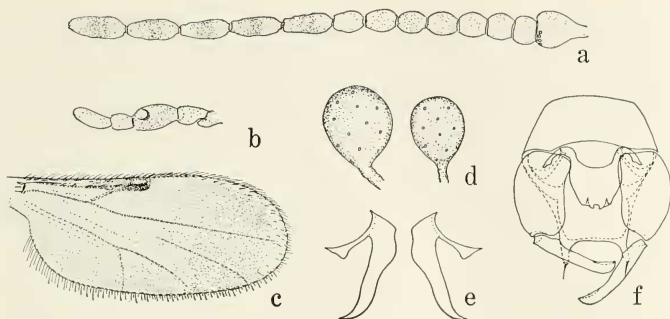


Fig. 3. *Ceratoculicoides virginianus* (Wirth): a, female antenna; b, female palpus; c, female wing; d, female spermathecae; e, male parameres; f, male genitalia, parameres removed.

***Ceratoculicoides virginianus* (Wirth), n. comb.**

(Fig. 3)

Helea (Isohelea) virginianus Wirth, 1951:318 (male, female; Virginia, Maryland; fig. male genitalia).

Ceratopogon (Nilohela) virginianus (Wirth): Wirth, 1965:133 (combination).

Female.—Length of wing 0.90–1.10 mm.

Head brown, antennae and palpi pale brown. Eyes practically bare, only a few very fine interfacetal hairs present. Antenna (fig. 3a) with proximal flagellomeres broader than long, gradually becoming longer and more slender, the distal five distinctly elongated; lengths in proportion of 12-13-14-15-17-18-19-30-30-30-32-35; antennal ratio 1.25. Palpal segments (fig. 3b) with lengths in proportion of 15-15-25-14-22; third segment short, length to breadth ratio 1.66; with a small deep sensory pit.

Thorax subshining brownish black, mesonotum with sparse, long, light brown hairs; coxae brown, remainder of legs yellow. Claws subequal, nearly as long as fifth tarsomere on fore and mid legs, small and equal, the size of male claws, on hind leg; hind basitarsus 2.2 as long as second tarsomere. Wing (fig. 3c) smoky grayish brown, the veins slightly infuscated; costa extending to 0.50 of wing length; macrotrichia absent except for a few along wing margin between tips of veins R5 and M2. Halter pale.

Abdomen: Deep brownish black. Spermathecae (fig. 3d) unequal in size, measuring $0.070 + 0.017$ (neck) by 0.058 mm and $0.052 + 0.016$ by 0.046 mm; ovoid, with long, slender, sclerotized neck arising obliquely.

Male.—Similar to the female with the usual sexual differences; antennal plumes yellowish brown; antennal segments 3–13 fused, lengths of 13–15 in proportion of 80-65-48. Genitalia (fig. 3f): Aedeagus with main body as broad as long, basal arch high, extending to a fourth of total length; apex broad, more or less truncate with a small distomesal notch, each distolateral lobe with two sharp, anterodorsally bent teeth. Parameres (fig. 3e) each short and stout, especially at base, with bluntly pointed tip somewhat bent ventrolaterally.

Distribution.—Eastern U.S.A. from New York to Florida and Texas.

Type.—Holotype male (pinned), Mount Solon, Virginia, 11 July 1950, W. W. Wirth (Type no. 60972, USNM).

Specimens Examined.—FLORIDA: Gainesville, Alachua Co., 20 April 1967, W. W. Wirth, light trap, 1 male; Torreya State Park, Liberty Co., April 1957, F. S. Blanton, light trap, 1 male, 3 females; 20 May 1966, H. V. Weems, light trap, 3 males, 3 females; 22 April 1967, W. W. Wirth, light trap, 2 males; Welaka, Putnam Co., 9 April 1964, H. A. Denmark, light trap, 1 male. MARYLAND: Forest Glen, Montgomery Co., 22 June 1967, W. W. Wirth, light trap, 1 male. NEW JERSEY: New Brunswick, 12 July 1958, W. W. Wirth, lake margin, 1 female. NEW YORK: Colton, Raquette River, S. Lawrence Co., 24 June 1963, W. W. Wirth, 1 female; Stoddard Hollow, Cattaraugus Co., 10 August 1961, J. L. Laffoon, 1 female. NORTH CAROLINA: Highlands, Macon Co., 17 July 1958, J. L. Laffoon, 1 male, 1 female. TEXAS: Kerrville, 2 June 1953, L. J. Bottimer, light trap, 2 females. VIRGINIA: Falls Church, 8 June 1952, W. W. Wirth, stream margin, 1 male, 1 female; Falls Church, Holmes Run, 24 June 1960, W. W. Wirth, light trap, 1 male, 1 female; Mount Solon, data as above, 1 male (holotype). WEST VIRGINIA: Lost River State Park, 23 May 1954, W. W. Wirth, 2 males, 1 female.

Discussion.—This species is readily distinguished from the other American species by its smaller size and yellowish legs. In the latter it resembles the Palearctic *C. gracilipes* (Remm).

***Ceratoculicoides gracilipes* (Remm), n. comb.**

Ceratopogon (Nilohoele) gracilipes Remm, 1967:28 (male, female; Caucasus; fig. eye separation, palpus, claws, genital sclerotization, spermatheca, male genitalia).

Female.—Length of wing 1.25–1.30 mm. Eyes separated. Mandible with strong teeth; proboscis short, a third of width of head. Antennal segments 3–6 spherical, 7–10 oval; antennal ratio 1.2. Wings slightly smoky, anterior veins darkened; costal ratio 0.69; numerous macrotrichia along wing margin between veins R5 and M1. Claws of fore leg large, of middle and hind leg small as in male. Spermatheca single.

Male.—Length of wing 1.03–1.10 mm. Head and thorax black, mesonotum shining, with slight grayish brown pruinosity and fine, pale, sparse hairs; legs except coxae light yellow; halteres cream-colored; wing milky, anterior veins darkened. Eyes pubescent. Antennal plume with yellowish reflection. A single radial cell, a little oblong, partially fused with radial vein; proximal half of vein M2 absent; macrotrichia absent. Genitalia with aedeagus longer than broad, with a median cleft distally, each distolateral lobe bearing two or three distinct chitinous points; parameres slender distally, with distal point distinctly bent back.

Distribution.—Kharagoule, Bruzenskaya SSR, in the Caucasus.

Discussion.—We are indebted to Dr. Lloyd V. Knutson for a translation of the original description from which the above description is

modified. *C. gracilipes* resembles *C. virginianus* in its yellow legs, but is a much larger species, about the same size as *C. blantonii* and *C. longipennis*. On two points *C. gracilipes* differs strikingly from the American species: the large claws are present only on the fore leg of the female, those of the mid and hind legs being small as in the male, and there is only a single spermatheca.

REFERENCES

- Clastrier, J.** 1961. Notes sur les Cératopogonidés XV.—*Ceratopogon* et *Alluaudomyia* de la Région Palearctique, Arch. Inst. Pasteur d'Algérie 39: 401–440.
- Kieffer, J. J.** 1921. Chironomides de l'Afrique Équatoriale. Ann. Soc. Ent. France 90:1–56, 2 plates.
- Macfie, J. W. S.** 1940. The genera of Ceratopogonidae. Ann. Trop. Med. Parasit. 34:13–30.
- Remm, H.** 1967. On the fauna of Ceratopogonidae (Diptera) in the Caucasus. Tartu Riikliku Ülikooli Toimetised 194:3–37 (in Russian).
- Wirth, W. W.** 1951. New species and records of Virginia Heleidae (Diptera). Proc. Ent. Soc. Wash. 53:313–326.
- . 1952. The Heleidae of California. Univ. Calif. Pubs. Ent. 9: 95–266.
- . 1965. Family Ceratopogonidae. In Catalog of Diptera of North America. U. S. Dept. Agr. Handbook 276, pp. 121–142.

A NEW PEDIوبيUS PARASITIC ON A THRIPS
(HYMENOPTERA: EULOPHIDAE)

B. D. BURKS, *Systematic Entomology Laboratory, Agricultural Research Service,
U. S. Department of Agriculture*¹

ABSTRACT—A new species of eulophid chalcidoid, *Pediobius thysanopterus*, is described. This is an internal parasite of the larvae of *Gynaikothrips ficorum* (Marchal), a thrips living in leaf-rolls on fig. The parasite is known from Israel and Egypt.

Very few chalcidoid parasites of thrips have been recorded. The eulophids, a species of *Tetrastichus* Haliday, a few species of *Ceranisis* Walker (= *Thripoctenus* Crawford and probably = *Epomphale* Girault), three species of *Thripoctenoides* Erdős, one species of *Thripobius* Ferrière, and two species of *Goetheana* Girault (= *Dasyscapus* Gahan), with three species of the trichogrammatid *Megaphragma* Timberlake, are all the chalcidoid parasites of thrips listed in the available indices (Thompson, 1951; Peck, 1963; cumulative host-parasite index main-

¹ Mail address: c/o U. S. National Museum, Washington, D.C. 20560.